



Water Management to Water Stewardship

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2014 INTERNATIONAL WORKSHOP ON
ENVIRONMENT AND ALTERNATIVE ENERGY

October 21-24, 2014
Kennedy Space Center, FL



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Overview

- URS
- Why water?
- What's the difference between water management and water stewardship?
- How does Water Footprint Assessment help?
- Case study

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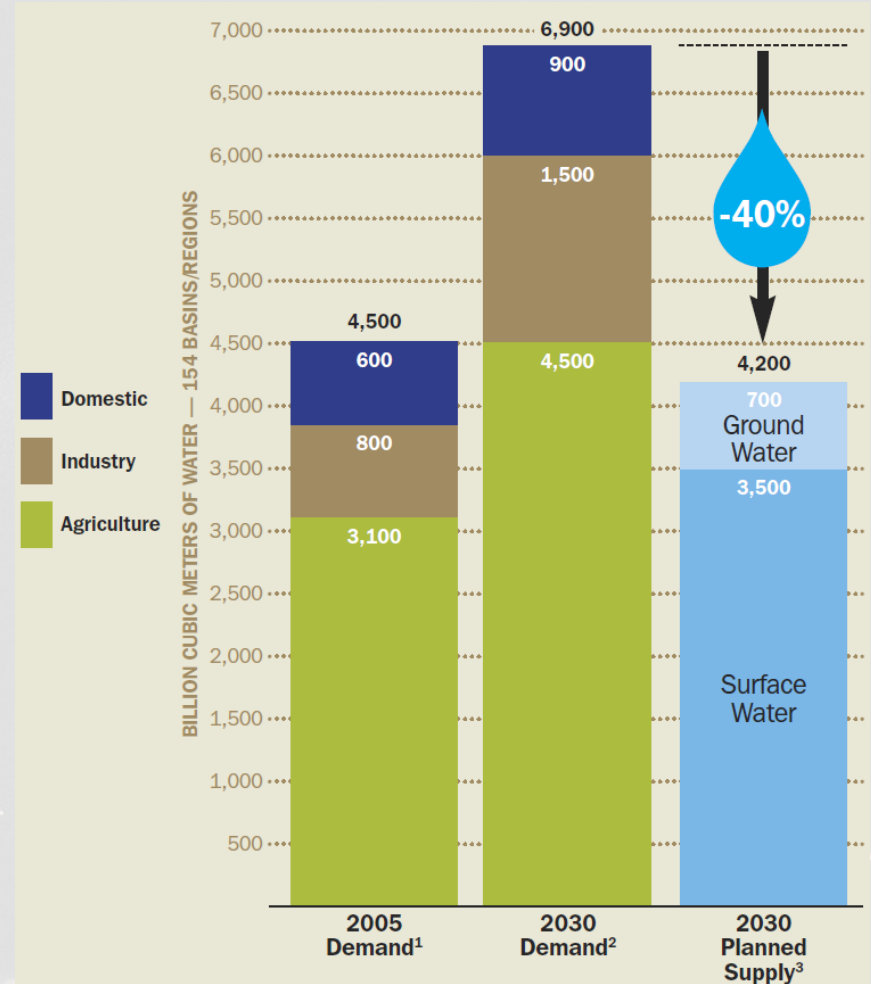
- Leading provider of engineering, construction and technical services for public and private sector clients worldwide
- Fully integrated capabilities to support every stage of the project life cycle — inception through start-up and operation to decommissioning and closure
- >50,000 employees in nearly 50 countries
- Water stewardship services include
 - Water efficiency and minimization
 - Water resource management / watershed assessment
 - Water footprint calculation and assessment
 - Flood risk and flood management
 - Wastewater management
- Long relationship working with NASA
 - Successfully completed multiple engineering and environmental programs, including performing Environmental Functional Reviews all NASA Centers

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Why Water?

- Pressure is mounting
 - Population growth
 - Economic growth
 - Supply degradation
 - Climate change
- By 2030 global water demand will outpace supply by 40%
- 2/3rds of world's population will live in water-stressed conditions by 2025

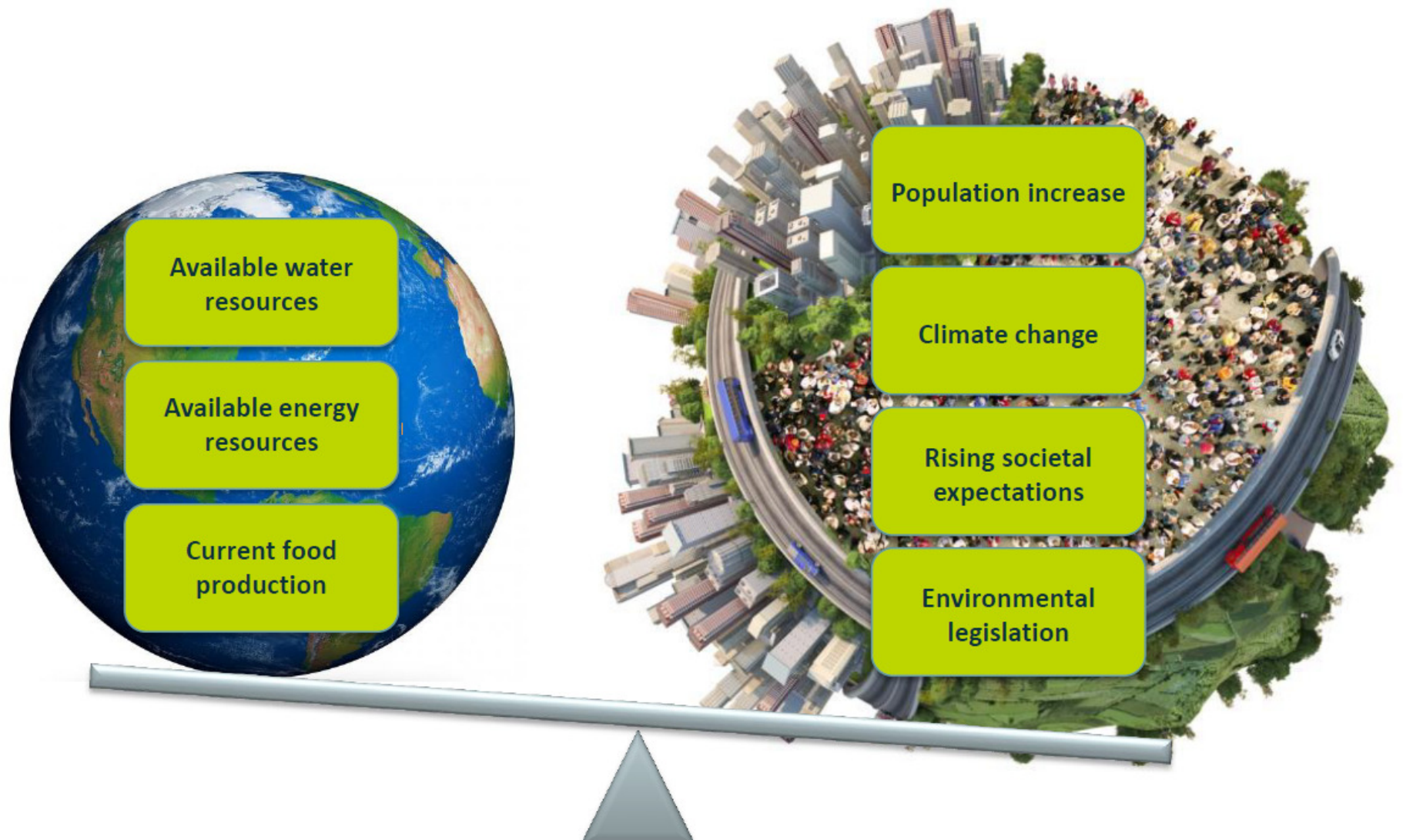




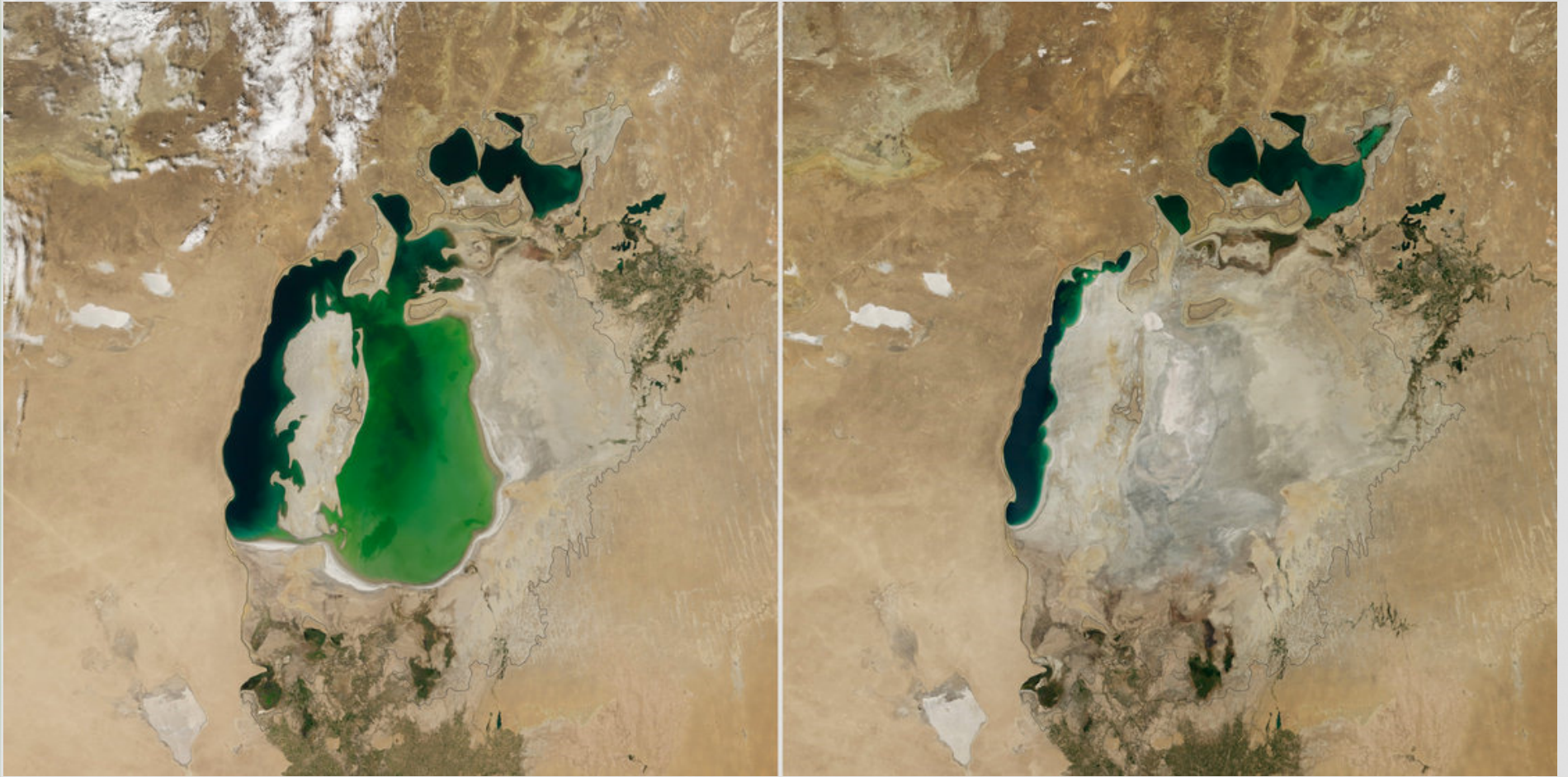
Water and Energy

- The water sector is becoming more energy intensive
 - Desalination
 - Pumping deeper groundwater
 - Large scale (inter basin) water transfers
- The energy sector is becoming more water intensive
 - Cooling water in power plants
 - Extracting and processing fossil fuels
 - Growing biofuels
 - Shale gas

The Challenge

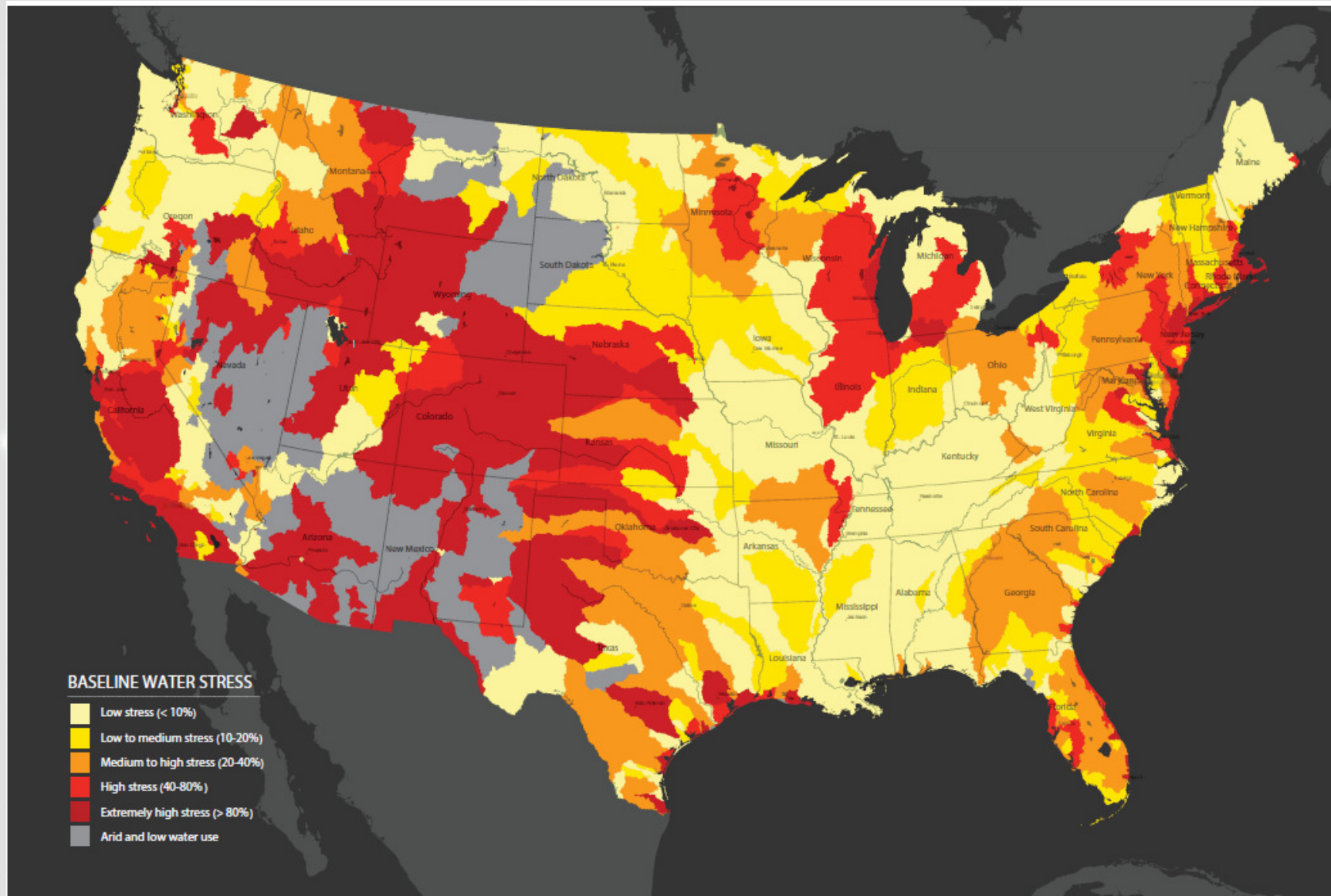


Signs of Water Stress

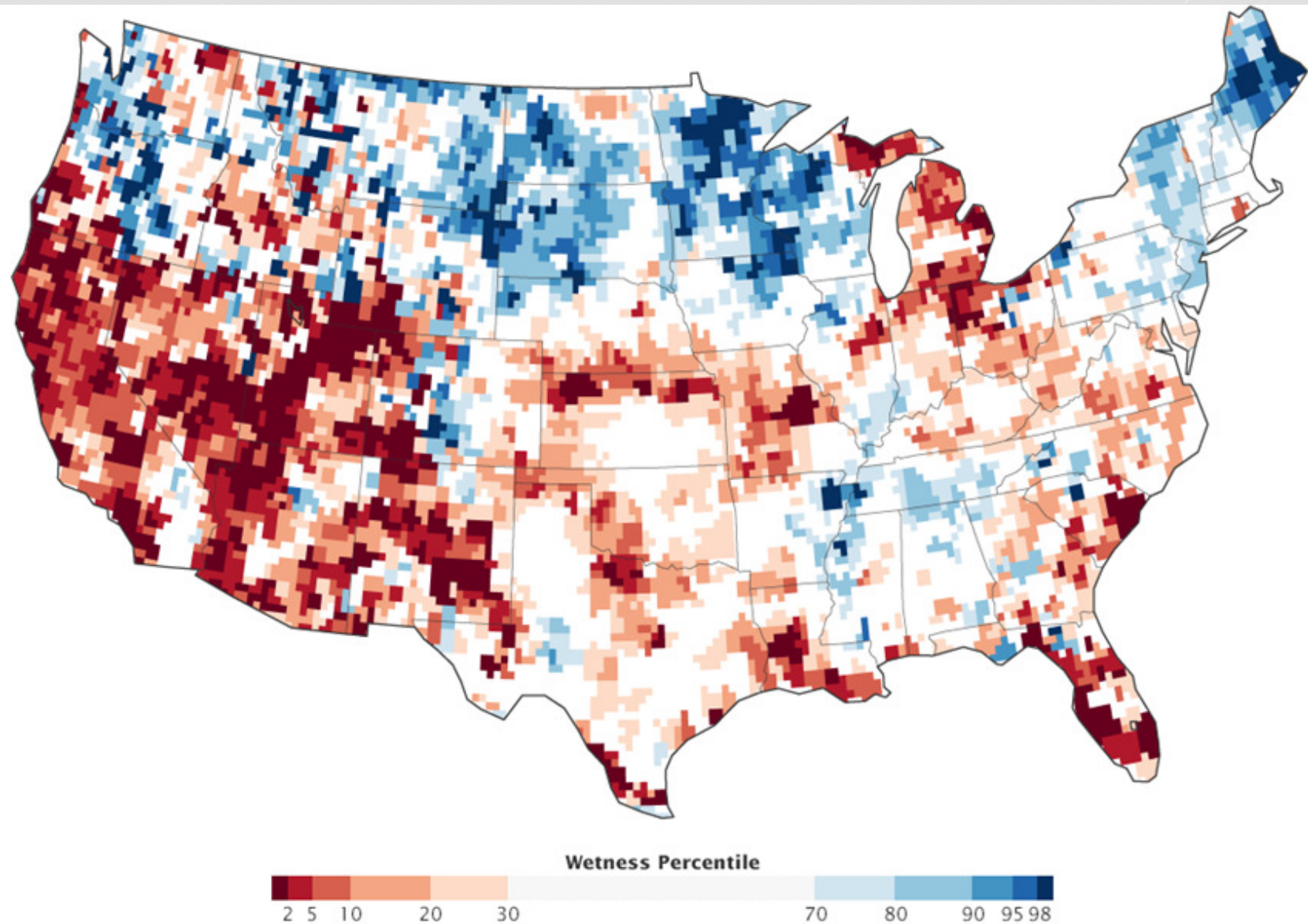


Images from August 2000 (left) and August 2014 (right) show the drop in water levels in the Aral Sea.

Signs of Water Stress



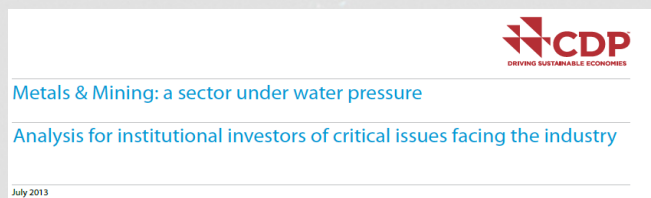
Signs of Water Stress



Source: <http://earthobservatory.nasa.gov/IOTD/view.php?id=84065>

Why Water?

- World Economic Forum's 2014 Global Risk Report ranked 'water crises' 3rd in global risks of greatest concern
- 46% U.S. companies already suffered detrimental business impacts as a result of water issues
- Costs for some as high as US\$400 million and projected impacts as high as US\$1 billion



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Water Stewardship

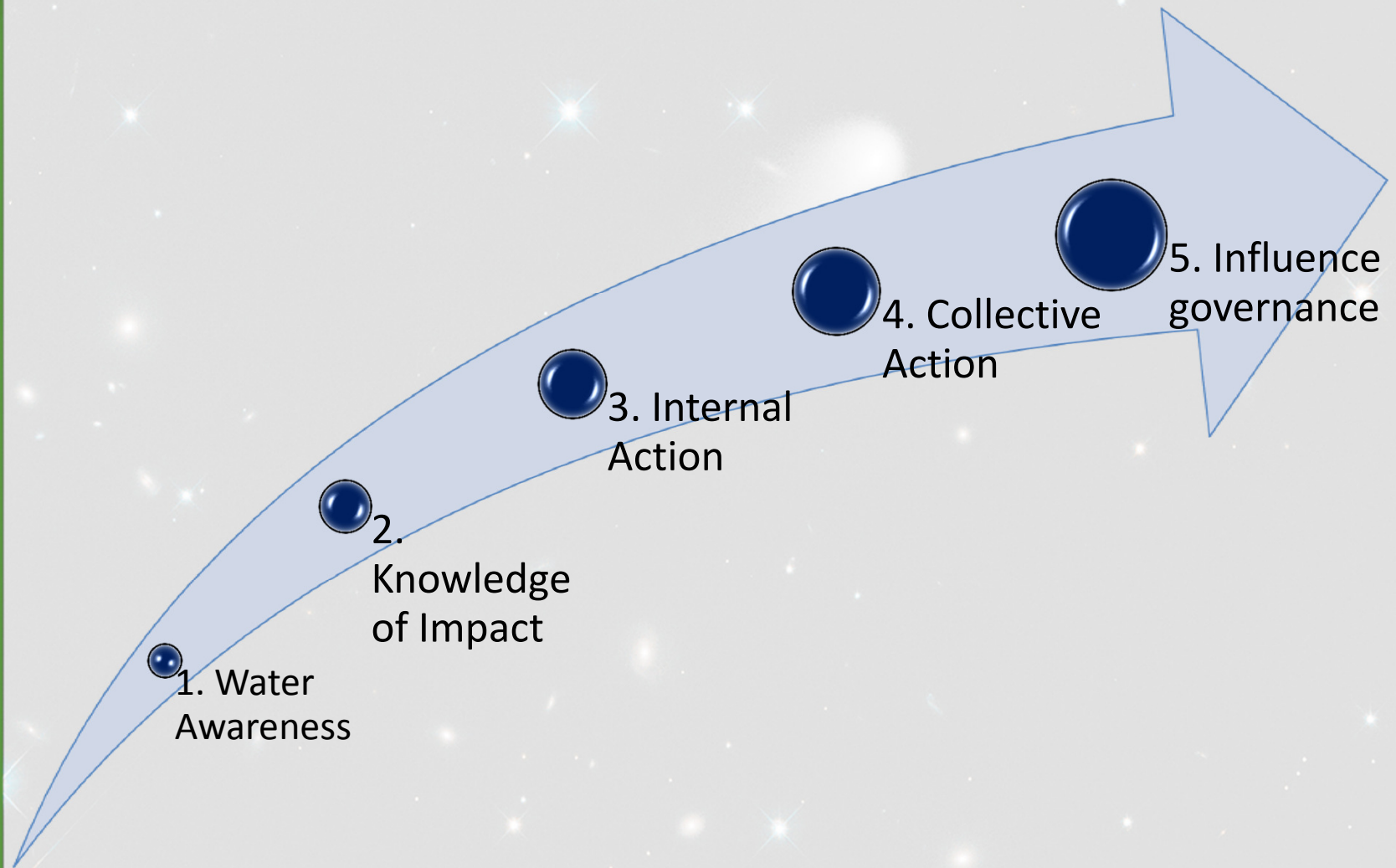
➤ Definition:

“a progression of increased improvement of water use and a reduction in the water-related impacts of internal and value chain operations. More importantly, it is a commitment to the sustainable management of shared water resources in the public interest through collective action with other businesses, governments, NGOs and communities.”

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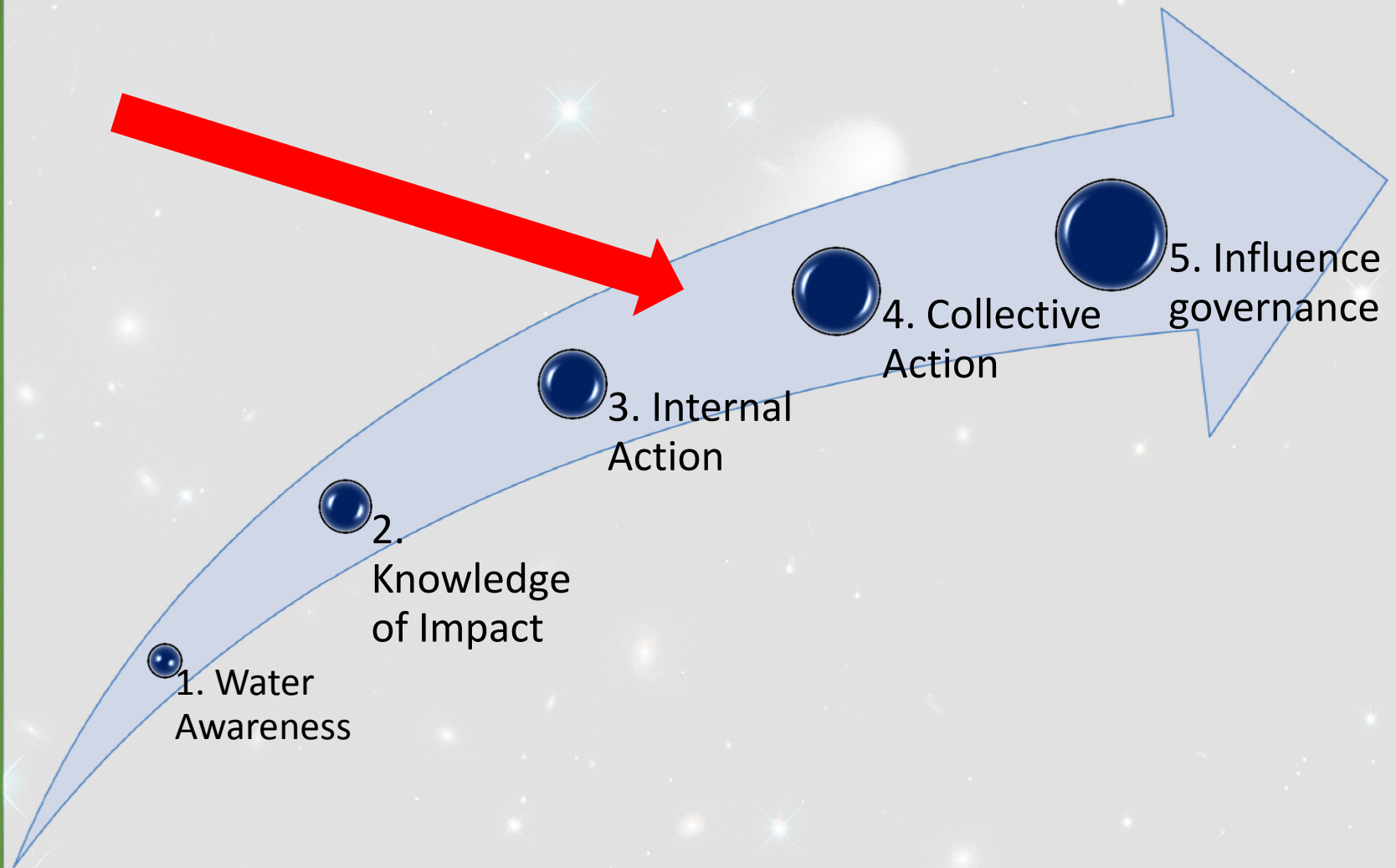
Water Stewardship



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Water Stewardship



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Water Footprint Assessment

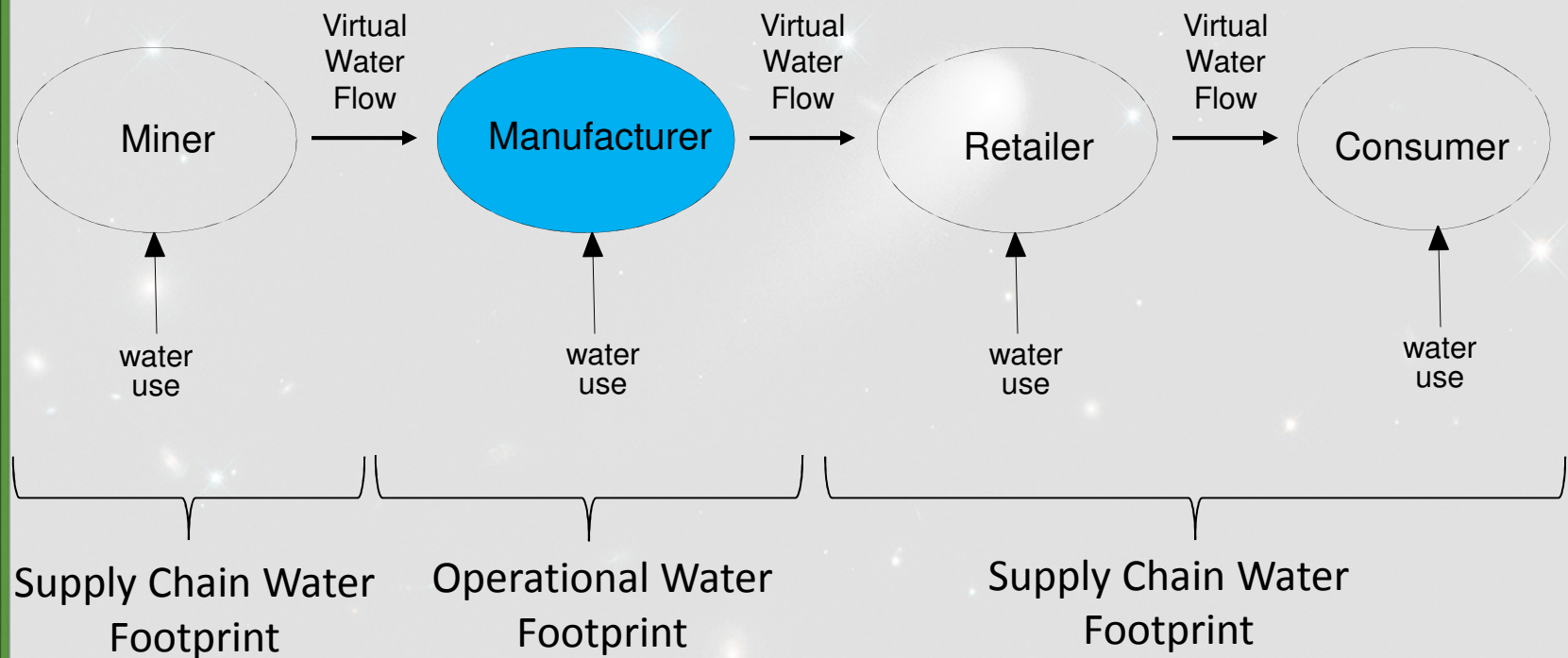
- **Volume** of fresh water used to produce the product (a commodity / good / service etc.) summed over the various steps of the **production chain**
 - Rainwater in growing agricultural raw materials
 - Water added into a product
 - Water used to generate the energy
 - Water used in washing / cooling / processing
 - Water used by consumers
 - Volume of water polluted
- When and **where** water is used
 - Water used locally and globally



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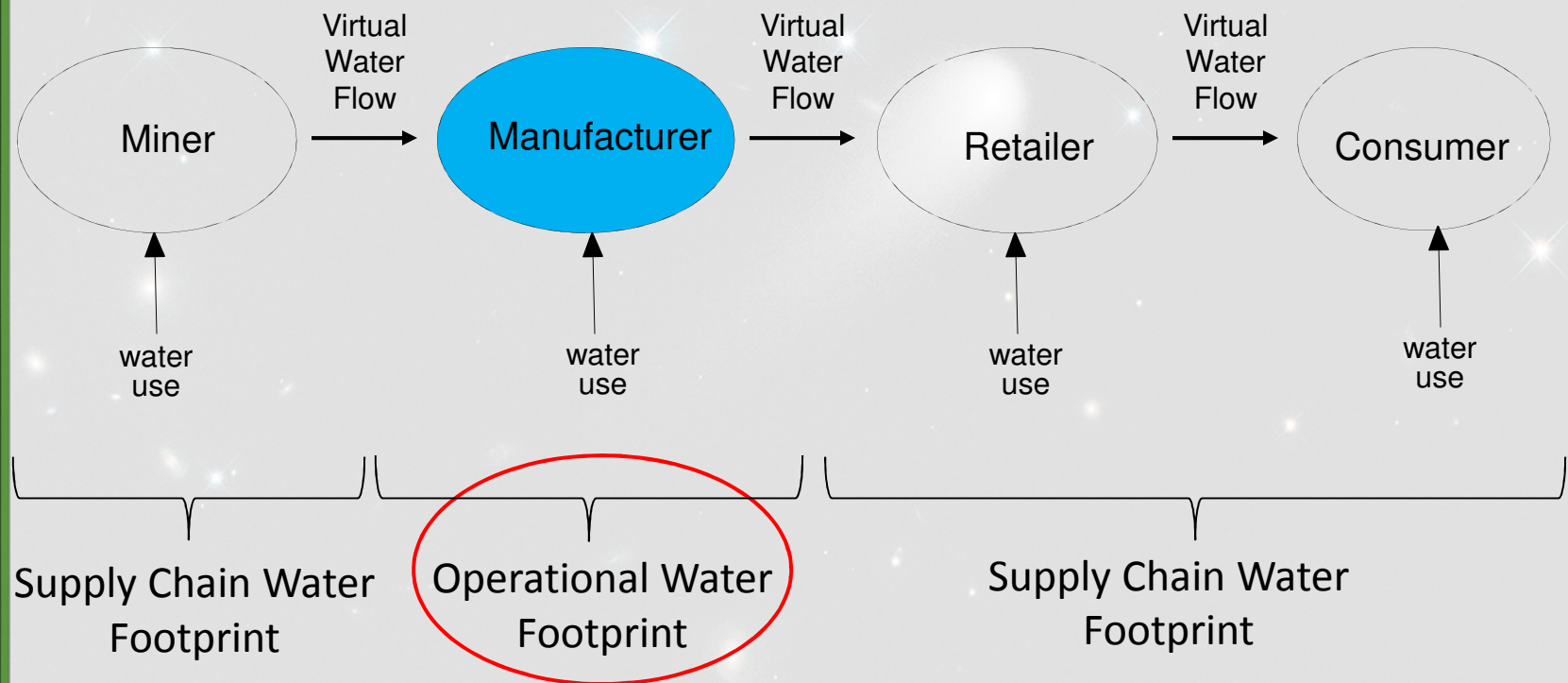
Beyond the Fence line



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Beyond the Fence line



The traditional statistics
on water use

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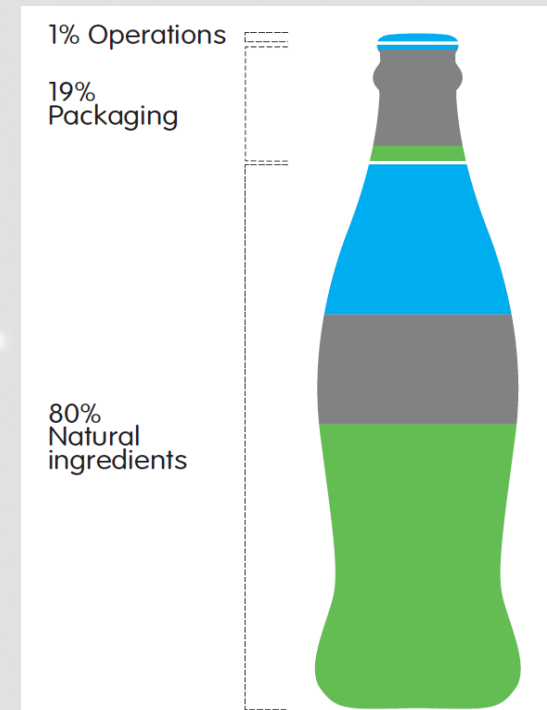
Water Footprint Example

Water footprint of a 0.5 liter PET-bottle coke



- 0.44 liter water content
- 3.0 liter for other ingredients & overheads
- 5.3 liter for PET bottle and closure
- 27.6 liter for sugar

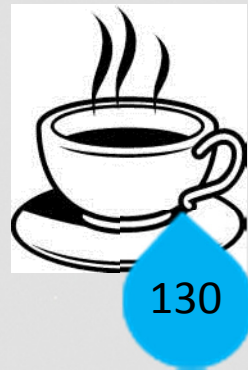
36 liter total



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Water Footprint Examples



- ✓ Sheet of paper = **10 liters**
- ✓ Sulphuric acid = **2,700 liters/ton**
- ✓ 1 liter bioethanol (from maize) = **2,900 liters**
- ✓ Cement = **3,300 liters/ton**
- ✓ Steel = **4,200 = liters /ton**

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Water Footprint of Energy

Primary energy carriers		Global average water footprint (liters/GJ)
Non-renewable	Natural gas	110
	Coal	160
	Crude oil	1,060
	Uranium	90
Renewable	Wind energy	0
	Solar thermal energy	270
	Hydropower	22,000
	Biomass energy	70,000 (average)

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From Where?

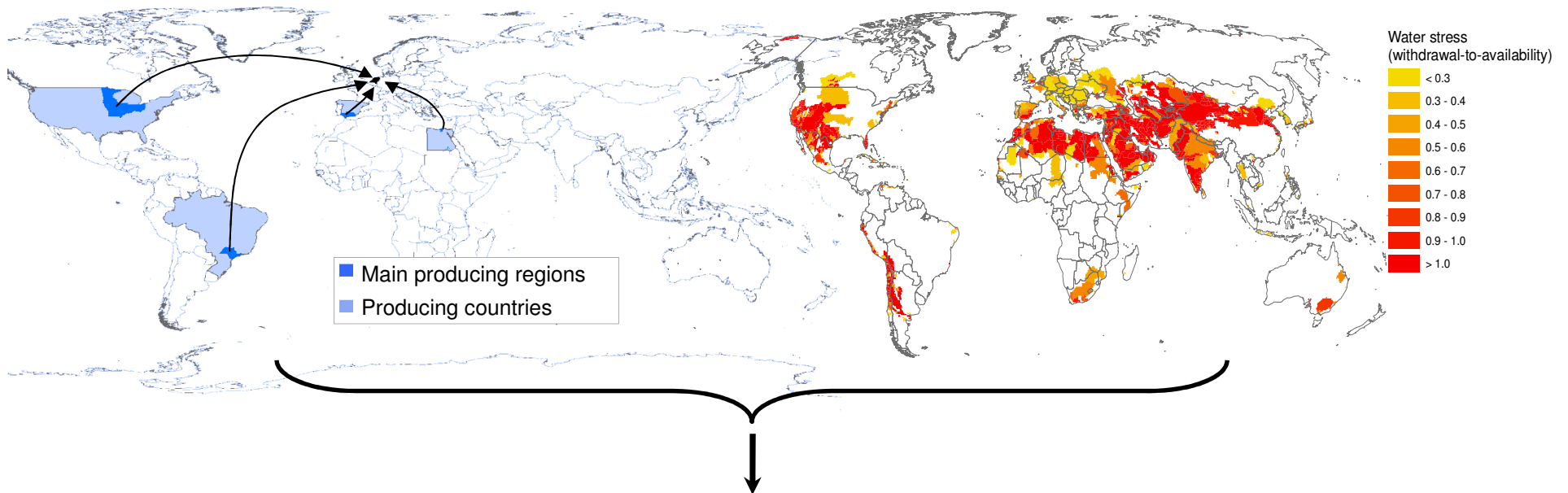
Size and shape of water footprint
+
water resource impacts in the locations in which the water is
consumed
=

Water footprint (impact) assessment

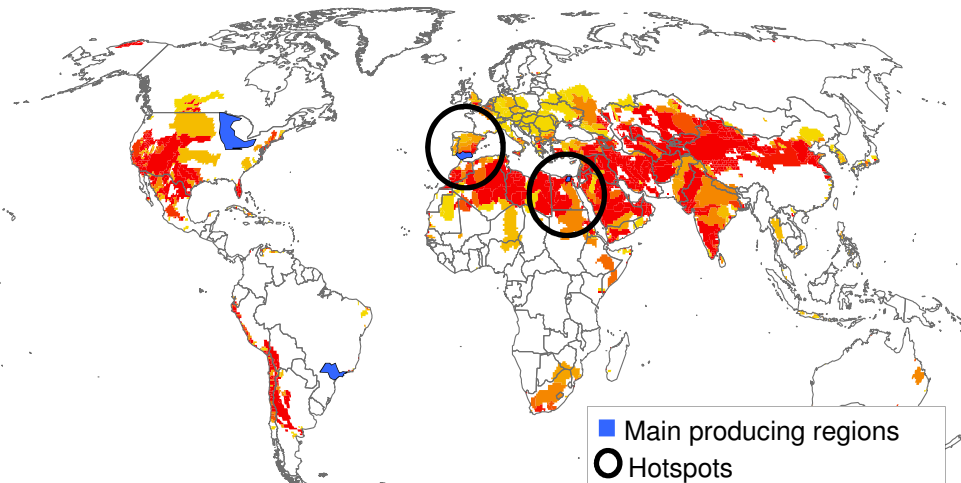
- Where constraints and pressures on water resources occur
- Risks and opportunities
- Information to formulate long-term water management policies and practices

Global WF of a business located in the Netherlands

Global water stress



Hotspots



Hotspots are where:

- (1) the business has a substantial WF
- (2) water is stressed

Case Study : Household Goods Manufacturer

Water footprint



35%
Raw Material



20%
Packaging
Material

<1%
Manufacturing
& Distribution



45%
Consumer Use

Water footprint x country specific scarcity factor = Water Impact

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Case Study : Household Goods Manufacturer

Water footprint



35%
Raw Material



20%
Packaging Material

<1%
Manufacturing
& Distribution



45%
Consumer Use

Water footprint x country specific scarcity factor = Water Impact

Water Impact



12%
Raw Material



7%
Packaging Material

<1%
Manufacturing
& Distribution



81%
Consumer Use

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Case Study : Household Goods Manufacturer

- Improved understanding of where key water supply pressures will arise in relation to both direct operations and supply chain
- Focus water efficiency measures at the most at risk points of value chain
- Identify new opportunities for products and services to reduce overall water impact
- Significant reduction in water consumption compared with investments related to the direct operations alone

To Summarize

- Consider own operations AND look beyond the fence line
- Water is not carbon - location, location, location !
- Collaboration – water is a shared resource

